

APPLIED Science & Technology (STA406)

Curriculum Mapping

2011-2012

	Topic	Depth	Time	Comments
TERM 1	Magnetism & Electricity <ul style="list-style-type: none">• Attraction & repulsion• Magnetic field live wire & solenoid• “hand rules”• Electrical charge• Static Electricity & electrical conductivity• Ohm’s law• Circuits• Power & electrical energy• Electromagnetic induction	Detailed with calculations of $R=V/I$, and Power and Energy.	Sept/mid-Oct	Chapter 5 Parts of 416 course Build circuits with light bulbs, switches and circuit boards Can use old 416 lab exams Build electromagnet
	Electrical Engineering <ul style="list-style-type: none">• Power supply• Conduction, insulation & protection• Typical controls• Resistor colour bands• Transformation of energy in a light bulb and stove element	Quick overview, mostly covered in Chapter 5	Oct	
COMMON ASSESSMENT 1	“Calculating Cost” 2010 MELS Final Lab Exam	Results to be included on Term 1 report		

TERM 2	<p>Technical World</p> <p>Materials</p> <ul style="list-style-type: none"> • Constraints (deflection & shearing) • Characteristics of mechanical properties • Heat treatments • Types & properties (plastics, ceramics, composites) • Modification of properties (degradation, protection) <p>Manufacturing</p> <ul style="list-style-type: none"> • Shaping (characteristics of drilling, tapping & threading) • Measurement & inspection (direct measurements, control, shape & position) <p>Graphical Language</p> <ul style="list-style-type: none"> • Multiview orthogonal projection • Functional dimensioning • Developments <p>Standards & representations</p> <p>Mechanical Engineering</p> <ul style="list-style-type: none"> • Adhesion & friction of parts • Linking of mechanical parts • Degrees of freedom • Guiding controls • motion transmission & transformation systems • Speed changes (gear ratios) • Resisting torque & engine torque 	<p>Very qualitative and descriptive, Do not spend too much time on “types of materials” or “manufacturing”</p> <p>Need a workshop to demonstrate</p> <p>Detailed, spend time drawing technical objects</p> <p>Detailed on links and motion transformation and transmission and gear ratios</p>		<p>Chapter 12</p> <p>Examples of wood, modified wood, metals, ceramics etc.</p> <p>Classification of plastics lab</p> <p>Plastics versus paper bag debate</p> <p>Need a workshop to demonstrate</p> <p>Build a catapult</p> <p>Drawing assignments in class, lots of practice</p> <p>Chapter 13</p> <p>use bicycle as example</p> <p>links practical test</p> <p>build a crane</p>
<p>COMMON ASSESSMENT 2</p>	<p><i>MELS Based Midterm</i></p>	<p>Results to be reported on Term 2 report</p>		

TERM 3	<p>Changes in Matter</p> <ul style="list-style-type: none"> Chemical changes (combustion & oxidation) Methods to prevent rusting <p>Energy</p> <ul style="list-style-type: none"> Law of conservation of energy Energy efficiency formula Heat vs temp <p>Motion & Forces & Fluids</p> <ul style="list-style-type: none"> Force Type of force Equilibrium of two forces Relationship between constant speed, distance & time Mass & weight Archimedes' principle Bernoulli's principle <p>Pascal's law</p> <p>Lithosphere</p> <ul style="list-style-type: none"> Minerals and rocks Energy resources Contamination <p>Hydrosphere</p> <ul style="list-style-type: none"> Catchment area Energy resources <p>Atmosphere</p> <ul style="list-style-type: none"> Air mass Cold front/warm front Cyclone & anticyclone Energy resources <p>Space</p> <ul style="list-style-type: none"> Solar energy flow Earth-moon system (gravitational effect) Tides and tidal energy <p>Dynamics of Ecosystems</p> <ul style="list-style-type: none"> Disturbances Trophic relationships Primary productivity Material & energy flow Decomposers Chemical Recycling Factors that influence distribution of biomes <p>Ecosystems</p>	<p>Qualitative</p> <p>Focus on calculations of energy effic.</p> <p>Detailed with calculations of forces and $v=d/t$</p> <p>Qualitative</p> <p>Focus on energy resources</p> <p>Focus on energy resources</p> <p>Very qualitative</p>	<p>Chapter 4</p> <p>Chapter 3</p> <p>Energy effic. Lab of candle vs. oil lamp</p> <p>Build a "boat" out of aluminum foil</p> <p>Discuss Archimedes and Bernoulli in detail</p> <p>Chapter 6</p> <p>energy resources assignment</p> <p>Chapter 6 & 7</p> <p>Soil profile</p> <p>Scratch test – hardness scale</p> <p>Rock and mineral classification lab</p> <p>Gravitational effect and moon/tides</p> <p>Tidal generator</p> <p>Debate on energy resources</p> <p>Chapter 8, 10</p> <p>Outside study (section off area of forest)</p> <p>Pond study</p> <p>Rotting log study</p> <p>Owl pellets</p> <p>Water filter lab</p>
	<p>Common Assessment 3</p> <p>"Wind Turbine"</p> <p>Construction and Evaluation</p>	<p>Results to be reported on Report 3</p> <p>June 22nd</p>	